

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Seattle
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Tel: (253)922-2310

TestAmerica Job ID: 580-79723-1

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

AECOM
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Attn: Amy Dahl

M. Elaine Walker

Authorized for release by:
9/5/2018 12:33:19 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Job ID: 580-79723-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-79723-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

One sample was received on 8/20/2018 3:10 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.1° C.

This report contains results of all analyses performed by TestAmerica Seattle.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

DIESEL AND MOTOR OIL RANGE ORGANICS

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The sample was prepared on 08/26/2018 and analyzed on 08/27/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS)

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for Metals (ICPMS) in accordance with 6020A_LL. The sample was prepared on 08/22/2018 and analyzed on 08/23/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared on 08/22/2018 and analyzed on 08/23/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for total organic carbon in accordance with SM 5310B. The sample was analyzed on 08/22/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Client Sample ID: PDI-RB-VV-180818

Date Collected: 08/18/18 16:30

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79723-1

Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11	0.065	mg/L		08/26/18 14:00	08/27/18 21:54	1
Motor Oil (>C24-C36)	ND		0.35	0.096	mg/L		08/26/18 14:00	08/27/18 21:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	69		50 - 150				08/26/18 14:00	08/27/18 21:54	1

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		08/22/18 13:14	08/23/18 13:48	1
Cadmium	ND		0.00040	0.00010	mg/L		08/22/18 13:14	08/23/18 13:48	1
Copper	0.011		0.0020	0.00060	mg/L		08/22/18 13:14	08/23/18 13:48	1
Lead	ND		0.00080	0.00020	mg/L		08/22/18 13:14	08/23/18 13:48	1
Zinc	ND		0.0070	0.0019	mg/L		08/22/18 13:14	08/23/18 13:48	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		08/22/18 18:46	08/23/18 13:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.23	J	1.0	0.19	mg/L			08/22/18 14:18	1

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-282502/1-A

Matrix: Water

Analysis Batch: 282534

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 282502

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11	0.065	mg/L		08/26/18 14:00	08/27/18 18:09	1
Motor Oil (>C24-C36)	ND		0.35	0.096	mg/L		08/26/18 14:00	08/27/18 18:09	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	80		50 - 150				08/26/18 14:00	08/27/18 18:09	1

Lab Sample ID: LCS 580-282502/2-A

Matrix: Water

Analysis Batch: 282534

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 282502

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits		
#2 Diesel (C10-C24)	2.00	1.49		mg/L		75	50 - 120		
Motor Oil (>C24-C36)	2.00	1.74		mg/L		87	64 - 120		
Surrogate	%Recovery	LCS Qualifier	Limits						
o-Terphenyl	83		50 - 150						

Lab Sample ID: LCSD 580-282502/3-A

Matrix: Water

Analysis Batch: 282534

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 282502

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
#2 Diesel (C10-C24)	2.00	1.50		mg/L		75	50 - 120	1	26
Motor Oil (>C24-C36)	2.00	1.77		mg/L		88	64 - 120	2	24
Surrogate	%Recovery	LCSD Qualifier	Limits						
o-Terphenyl	82		50 - 150						

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-282187/21-A

Matrix: Water

Analysis Batch: 282351

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 282187

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		08/22/18 13:14	08/23/18 13:35	1
Cadmium	ND		0.00040	0.00010	mg/L		08/22/18 13:14	08/23/18 13:35	1
Copper	ND		0.0020	0.00060	mg/L		08/22/18 13:14	08/23/18 13:35	1
Lead	ND		0.00080	0.00020	mg/L		08/22/18 13:14	08/23/18 13:35	1
Zinc	ND		0.0070	0.0019	mg/L		08/22/18 13:14	08/23/18 13:35	1

Lab Sample ID: LCS 580-282187/22-A

Matrix: Water

Analysis Batch: 282351

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 282187

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits		
Arsenic	4.00	4.03		mg/L		101	80 - 120		

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-282187/22-A
Matrix: Water
Analysis Batch: 282351

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 282187

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	0.100	0.108		mg/L		108	80 - 120
Copper	0.500	0.496		mg/L		99	80 - 120
Lead	1.00	1.01		mg/L		101	80 - 120
Zinc	4.00	3.98		mg/L		100	80 - 120

Lab Sample ID: LCSD 580-282187/23-A
Matrix: Water
Analysis Batch: 282351

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 282187

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Arsenic	4.00	4.09		mg/L		102	80 - 120	1	20
Cadmium	0.100	0.107		mg/L		107	80 - 120	1	20
Copper	0.500	0.496		mg/L		99	80 - 120	0	20
Lead	1.00	1.01		mg/L		101	80 - 120	0	20
Zinc	4.00	4.02		mg/L		101	80 - 120	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-282235/21-A
Matrix: Water
Analysis Batch: 282350

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 282235

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		08/22/18 18:46	08/23/18 12:13	1

Lab Sample ID: LCS 580-282235/22-A
Matrix: Water
Analysis Batch: 282350

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 282235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00220		mg/L		110	80 - 120

Lab Sample ID: LCSD 580-282235/23-A
Matrix: Water
Analysis Batch: 282350

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 282235

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	0.00200	0.00211		mg/L		106	80 - 120	4	20

Method: SM 5310B - Organic Carbon, Total (TOC)

Lab Sample ID: MB 580-282342/22
Matrix: Water
Analysis Batch: 282342

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.19	mg/L			08/22/18 14:18	1

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Method: SM 5310B - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCS 580-282342/23

Matrix: Water

Analysis Batch: 282342

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	10.3		mg/L		103	85 - 115

Lab Chronicle

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Client Sample ID: PDI-RB-VV-180818

Date Collected: 08/18/18 16:30

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79723-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			282502	08/26/18 14:00	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	282534	08/27/18 21:54	CJ	TAL SEA
Total Recoverable	Prep	3005A			282187	08/22/18 13:14	T1H	TAL SEA
Total Recoverable	Analysis	6020B		1	282351	08/23/18 13:48	FCW	TAL SEA
Total/NA	Prep	7470A			282235	08/22/18 18:46	T1H	TAL SEA
Total/NA	Analysis	7470A		1	282350	08/23/18 13:12	FCW	TAL SEA
Total/NA	Analysis	SM 5310B		1	282342	08/22/18 14:18	TTN	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM

TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Sample Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79723-1	PDI-RB-VV-180818	Water	08/18/18 16:30	08/20/18 15:10

1

2

3

4

5

6

7

8

9

10

11

IRB = 2.5/2.5 w/c.s.

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Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79723-1

Login Number: 79723

List Source: TestAmerica Seattle

List Number: 1

Creator: Antonson, Angeline D

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	